

What is claimed is:

- 1 1. A method for providing quality of service (QoS)-driven channel access within
2 a basic service set (BSS) in a wireless network, the method comprising steps of:
3 sending a contention control (CC) frame from a point coordinator (PC) station
4 of the BSS, the CC frame containing information relating to a number of available
5 centralized contention opportunities (CCOs) for receiving a reservation request (RR) in a
6 centralized contention interval (CCI) following the CC frame, the CC frame further
7 containing information relating to the identification of stations from which a RR was
8 successfully received by the PC station in a preceding CCI, the CC frame being sent by the
9 PC station during a contention-free period (CFP) of a superframe, the superframe including a
10 contention-free period (CFP) and a contention period (CP);
11 receiving the CC frame at a non-PC station in the BSS;
12 sending an RR in a selected one of the available CCOs in the CCI in response
13 to the received CC frame, the RR being sent from the non-PC station when the non-PC
14 station has a burst of data frames to send, and the RR indicating an amount of bandwidth
15 requested by the non-PC station sending the RR for transmitting the burst;
16 receiving the RR frame at the PC-station in one of the CCOs of the CCI;
17 sending a multipoll frame from the PC station containing information relating
18 to at least two transmission opportunities (TOs) assigned to at least one non-PC station in the
19 BSS for data transmission;

20 receiving the multipoll frame at at least one non-PC station in the BSS; and
21 sending at least one data frame in respective TOs from each non-PC station
22 that is identified in the multipoll frame in response to the received multipoll frame.

1 2. The method according to claim 1, wherein the at least one data frame sent by a
2 non-PC station in response to a TO originates from one of a continuous/periodic flow type of
3 traffic source, a discontinuous/bursty flow type of traffic source, and a best-
4 effort/asynchronous traffic source,
5 the method further comprising a step of periodically allocating at least one TO
6 for each non-PC station having a continuous/periodic flow type of traffic source based on at
7 least one QoS parameter value maintained within the PC station.

1 3. The method according to claim 1, wherein the burst of data frames for which a
2 RR is sent by a non-PC station originates from one of a discontinuous/bursty flow type of
3 traffic source and a best-effort/asynchronous traffic source;
4 the method further comprising steps of:
5 allocating at least one TO for each non-PC station having a
6 discontinuous/bursty flow type of traffic source based on at least one QoS parameter value
7 maintained within the PC station upon an indication by the non-PC station, via a RR, of a
8 new bursty arrival originating from a discontinuous/bursty flow type of traffic source at the

9 non-PC station, and
10 allocating at least one TO for each non-PC station having a best-
11 effort/asynchronous traffic source on a best-effort basis upon an indication by the non-PC
12 station, via a RR, of a new bursty arrival originating from a best-effort/asynchronous traffic
13 source at the non-PC station.

1 4. The method according to claim 1, wherein the information contained in the
2 multipoll frame further includes information relating to a length of each TO.

1 5. The method according to claim 1, further comprising a step of scheduling
2 transmission of down-stream traffic from the PC station and to at least one selected non-PC
3 station in the BSS.

1 6. The method according to claim 1, wherein the wireless network is a wireless
2 local area network (WLAN).

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2 7. A system for providing quality of service (QoS)-driven channel access within
3 a basic service set (BSS) in a wireless network, the system comprising:
4 a point coordinator (PC) station within the BSS sending a contention control
5 (CC) frame, the CC frame containing information relating to a number of available

6 centralized contention opportunities (CCOs) for receiving a reservation request (RR) in a
7 centralized contention interval (CCI) following the CC frame, the CC frame further
8 containing information relating to the identification of stations from which an RR was
9 successfully received by the PC station in a preceding CCI, the CC frame being sent by the
10 PC station during a contention-free period (CFP) of a superframe, the superframe including a
11 contention-free period (CFP) and a contention period (CP); and
12 at least one non-PC station receiving the CC frame at a non-PC station in the
13 BSS, a non-PC station sending an RR in a selected one of the available CCOs in the CCI in
14 response to the received CC frame, each RR being sent when the corresponding non-PC
15 station has a burst of data frames to send, each RR indicating an amount of bandwidth
16 requested by the non-PC station sending the RR for transmitting the burst.

1 8. The system according to claim 7, wherein the PC station receives the RR
2 frame at the PC-station in one of the CCOs of the CCI, and
3 wherein the PC station sends a multipoll frame containing information
4 relating to at least two transmission opportunities (TOs) assigned to at least one non-PC
5 station in the BSS for data transmission.

1 9. The system according to claim 8, wherein at least one non-PC station in the
2 BSS identified in the multipoll frame receives the multipoll frame, and sends at least one data
3 frame in at least one of the TOs that are identified in the multipoll frame.

1 10. The system according to claim 9, wherein the at least one data frame sent by a
2 non-PC station in response to a TO originates from one of a continuous/periodic flow type of
3 traffic source, a discontinuous/bursty flow type of traffic source, and a best-
4 effort/asynchronous traffic source,

5 wherein the PC station periodically allocates at least one TO for each non-PC
6 station having a continuous/periodic flow type of traffic source based on at least one QoS
7 parameter value maintained within the PC station.

1 11. The system according to claim 7, wherein the burst of data frames for which
2 an RR is sent by a non-PC station originates from one of a discontinuous/bursty flow type of
3 traffic source and a best-effort/asynchronous traffic source;

4 wherein the PC station allocates at least one TO for each non-PC station
5 having a discontinuous/bursty flow type of traffic source based on at least one QoS parameter
6 value maintained within the PC station upon an indication by the non-PC station, via an RR,
7 of a new bursty arrival originating from a discontinuous/bursty flow type of traffic source at
8 the non-PC station, and wherein the PC station allocates at least one TO for each non-PC

1 12. The system according to claim 9, wherein the information contained in the
2 multipoll frame further includes information relating to a length of each TO.

1 14. The system according to claim 7, wherein the wireless network is a wireless
2 local area network (WLAN).

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11 receiving an RR frame at the PC station in one of the CCOs of the CCI, the
12 RR being sent in a selected one of the available CCOs in the CCI in response to the received
13 CC frame, the RR being sent from the non-PC station when the non-PC station has a burst of
14 data frames to send, and the RR indicating an amount of bandwidth requested by the non-PC
15 station sending the RR for transmitting the burst.

1 17. The method according to claim 16, wherein the information contained in the
2 multipoll frame further includes information relating to a length of each TO.

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3 traffic source and a best-effort/asynchronous traffic source,
4 the method further comprising steps of:
5 periodically allocating at least one TO for each non-PC station having one of a
6 continuous/periodic flow type of traffic source and a discontinuous/bursty flow type of traffic
7 source based on at least one QoS parameter value maintained within the PC station,
8 allocating at least one TO for each non-PC station having a
9 discontinuous/bursty flow type of traffic source based on at least one QoS parameter value
10 maintained within the PC station upon an indication by the non-PC station, via an RR, of a
11 new bursty arrival originating from a discontinuous/bursty flow type of traffic source at the
12 non-PC station, and
13 allocating at least one TO for each non-PC station having a best-
14 effort/asynchronous traffic source on a best-effort basis upon an indication by the non-PC
15 station, via an RR, of a new bursty arrival originating from a best-effort/asynchronous traffic
16 source at the non-PC station.

1 19. The method according to claim 15, further comprising a step of scheduling
2 transmission of down-stream traffic from the PC station and to at least one selected non-PC
3 station in the BSS.

1 20. The method according to claim 15, wherein the wireless network is a wireless

2 local area network (WLAN).

1 21. A method for providing quality of service (QoS)-driven channel access within
2 a basic service set (BSS) in a wireless network, the method comprising steps of:
3 receiving a contention control (CC) frame at a non-PC station in the BSS, the
4 CC frame being sent from a point coordinator (PC) station of the BSS, the CC frame
5 containing information relating to a number of available centralized contention opportunities
6 (CCOs) for receiving a reservation request (RR) in a centralized contention interval (CCI)
7 following the CC frame, the CC frame further containing information relating to the
8 identification of stations from which an RR was successfully received by the PC station in a
9 preceding CCI, the CC frame being sent by the PC station during a contention-free period
10 (CFP) of a superframe, the superframe including a contention-free period (CFP) and a
11 contention period (CP); and
12 sending an RR in a selected one of the available CCOs in the CCI in response
13 to the received CC frame, the RR being sent from the non-PC station when the non-PC
14 station has a burst of data frames to send, the RR indicating an amount of bandwidth
15 requested by the non-PC station sending the RR for transmitting the burst.

1 22. The method according to claim 21, further comprising steps of:
2 receiving a multipoll frame at at least one non-PC station in the BSS, the

3 multipoll frame being sent from the PC station and containing information relating to at least
4 two transmission opportunities (TOs) assigned to at least one non-PC station in the BSS for
5 data transmission; and
6 sending at least one data frame in respective TOs from each non-PC station
7 that is identified in the multipoll frame in response to the received multipoll frame.

1 23. The method according to claim 22, wherein the at least one data frame sent by
2 a non-PC station originates from one of a continuous/periodic flow type of traffic source, a
3 discontinuous/bursty flow type of traffic source, and a best-effort/asynchronous traffic
4 source.

1 24. The method according to claim 21, wherein the burst of data frames for which
2 an RR is sent by a non-PC station originates from one of a discontinuous/bursty flow type of
3 traffic source and a best-effort/asynchronous traffic source.

1 25. The method according to claim 21, wherein the wireless network is a wireless
2 local area network (WLAN).